CLAIMS

1. A lighting device comprising a light source and a wall that lets at least a portion of the radiation emitted by said source pass therethrough, said wall being coated over at least a portion of at least one of its two faces with a photocatalytically active layer, **characterized in that**, under the lowest illumination conditions, the photocatalytic activity of said layer is high enough to degrade the organic soiling and to reduce it to particles that do not adhere to said layer and can be easily removed therefrom, and/or to give said layer a hydrophilic character.

2. The lighting device as claimed in claim 1, **characterized in that** said device comprises TiO_2 and in that its photocatalytic activity, under radiation of wavelength centered on 365 nm and of 50 W/m^2 power, causes the rate of disappearance of palmitic acid deposited on said layer, determined by haze measurement and expressed relative to the amount of TiO_2, is at least 10 $nm.h^{-1}.\mu g^{-1}.cm^2$.

3. The lighting device as claimed in claim 1 or 2, **characterized in that** said wall is essentially made of glass.

4. The lighting device as claimed in claim 3, **characterized in that** the glass of the wall is toughened in such a way that an area measuring 50 × 50 mm breaks into at least 40 fragments.

5. The lighting device as claimed in claim 4, **characterized in that** the glass of the wall is toughened in such a way that an area measuring 50 × 50 mm breaks into more than 60 fragments.

6. The lighting device as claimed in claim 3, **characterized in that**, at least in one region of its surface directed toward said photocatalytically active layer, the total content of alkali and alkaline-earth metal oxides of said glass wall does not exceed 15% by weight, while the sodium oxide content does not exceed 10% by weight.

7. The lighting device as claimed in claim 1 or 2, **characterized in that** said wall is essentially made of a transparent plastic or of several plastics in combination.

8. The lighting device as claimed in claim 3 or 7, **characterized in that** a barrier layer, preventing the diffusion of alkali metals from the glass, or a scratch-resistant layer, especially based on silicon, is inserted between said wall and said photocatalytically active layer.

9. The lighting device as claimed in one of the preceding claims, **characterized in that** said photocatalytically active layer has a thickness of between 100 and 1000 nm and contains 1 to 100 $\mu g/cm^2$, preferably 2 to 65 $\mu g/cm^2$, of TiO_2.

10. The lighting device as claimed in one of the preceding claims, **characterized in that** it includes means for spraying liquid onto said photocatalytically active layer.

11. The lighting device as claimed in one of the preceding claims, **characterized in that** said wall is coated at least on its face opposite said light source with said photocatalytically active layer.

12. The lighting device as claimed in one of the preceding claims, **characterized in that** said layer

comprises TiO_2 doped with Fe, Nb, Ta, Pt, Rh, Ag, Pd, Sn, Cd, W, Ce, Zr, Cu, Ru, Mo, Al, Bi, V, Co and/or Ni, optionally their oxides and/or salts, especially in particulate form with dimensions smaller than those of the TiO_2 particles and intimately blended or alloyed therewith.

13. A process for manufacturing a lighting device as claimed in one of the preceding claims, in which said photocatalytically active layer is formed by a sol-gel method, by chemical vapor deposition (CVD) or atmospheric-pressure plasma-enhanced chemical vapor deposition (APPECVD), or under a vacuum or reduced pressure, especially by magnetically enhanced cathode sputtering (or magnetron sputtering).

14. The process as claimed in claim 13, in which said photocatalytically active layer is formed as a mesoporous structure by a sol-gel method, comprising:

- the preparation of a liquid composition comprising at least one precursor of the essentially mineral material constituting the mesoporous structure of said layer and at least one organic structuring agent;
- the precipitation of the precursor around the organic structuring agent and the growth of molecules derived from the precursor;
- the addition into the liquid composition of elementary crystallites or nanoparticles of optionally doped titanium oxide, with diameters between 0.5 and 100 nm;
- the application of the composition to the surface to be coated; and
- the elimination of the organic structuring agent, the titanium oxide crystallites being incorporated into the mesoporous structure while essentially maintaining their integrity, it being

possible for several of them to be aggregated as nanoparticles therein.

15. The process as claimed in claim 13 or 14, which is carried out at temperatures not exceeding 250°C, so as in particular to preserve conventional toughening of glass.

16. The application of the lighting device as claimed in one of claims 1 to 12 to the lighting of a tunnel, to public lighting or the lighting of airport runways, or to headlights or signal lights for transport vehicles, whether on land, on water or in the air, especially motor vehicles, and also to interior lighting.